ABSTRACT

An apparatus for *in vivo*, endoscopic laser Raman spectroscopy probe and methods for its use are described. The probe comprises a fiber bundle assemble small enough to fit through an endoscope instrument channel, a novel combination of special coatings to the fiber bundle assembly, including a short-pass filter on the illumination fiber and a long-pass filter on the collection fiber bundle, a novel filter adapter comprising collimating lenses, focusing lenses, a band-pass filter, and a notch filter, and a round-to-parabolic linear array fiber bundle. The apparatus further comprises a laser to deliver illumination light and a spectrometer to analyze Raman-scattered light from a sample. The analysis of Raman spectra from *in vivo* measurements can discover molecular and structural changes associated with neoplastic transformations and lead to early diagnosis and treatment of cancer.

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